

Quote: “Natural Selection on **single gene traits** can lead to changes in allele frequencies and, thus, to **changes in phenotype frequencies.**” [emphasis added]

Question: What if a single gene influences multiple biological systems? (Called **pleiotropy**)
Do multiple traits usually arise from each expressed gene? (yes)

Since mutations are the sole origin of any theoretically new genetic information that can be selected for by evolution, would mutations bring more harm than benefit through pleiotropy? (yes, as explained below)

Reference (1) Dr. Jerry Bergman, “The Pleiotropy Problem for Evolution,” *CRSQ* Vol. 46 #4, 2010.

Pleiotropy is the effect resulting from an interconnected genetic system in which a single gene influences many different biological systems in positive or negative ways. Multiple traits of organisms usually arise from each expressed gene. In his paper examining the adverse affects of pleiotropy on the effectiveness of natural selection, Dr. Jerry Bergman concluded that pleiotropy creates a major problem for evolutionary theory, because the accumulation of mutations, even beneficial mutations, often has negative effects. (1, p. 284)

Because the theory of evolution relies on changes produced by selection of mutations as the source of genetic variety, pleiotropy creates a major genetic barrier for both micro- and macroevolution. Bergman quotes Hodgkin who admitted, “In complex eukaryotes, **pleiotropy may lead to major constraints** on possible mutational avenues” that might allow evolution to occur.

Genes never operate alone—they are part of a highly interrelated biological system. Even if a mutation is positive for one trait, negative or lethal effects result as well, by disrupting part of a branching biochemical pathway. “**This fact causes a critical difficulty for evolution.**” (1, p. 286). Some examples: A protein that is encoded by one gene often serves several functions, and a single gene product interacts with different proteins in different cell types. A mutation in Hox [developmental] genes often produces a cascade of ultimately lethal changes. Some enzymes are used to catalyze the same reaction in many different organs. Sickle cell anemia (a single mutation on the hemoglobin gene) can cause leg ulcers, bone issues, blood clots, anoxia, spleen damage, strokes, & hemolysis.

Evidence now exists that there can be a dozen or more overlapping codes in a single gene! Changing one nucleotide can thus effect multiple, overlapping messages or proteins. Therefore, it is clear today that a majority of genes have pleiotropic effect.

Conclusion: Since mutations are the sole origin of any theoretically new genetic information that can be selected for by evolution, even positive mutations would bring more harm than benefit through pleiotropy. **Therefore, the evidence of pleiotropy opposes evolution.**